

REMARKS/ARGUMENTS

Claims 1-3 and 7-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee, US patent No. 6,514,816. Claims 4-6 are rejected under 35 U.S.C. 103(a) as
5 being unpatentable over Lee in view of Alsmeier US patent No. 5,867,420.

1. Rejection of claims 1-3 and 7-8 under 35 U.S.C. 102(e):

Claims 1-3 and 7-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee, US patent No. 6,514,816 for reasons of record, as cited on pages 2-4 of the
10 above-identified Office action.

For clearly describing the difference of this application and Lee's application, claim 1 is listed below:

Claim 1: "An isolation structure of a trench capacitor, the trench capacitor being
15 disposed in a deep trench of a substrate and comprising:

a storage node serving as a top plate of the capacitor in the deep trench;

a bottom plate buried in the substrate around the deep trench;

a capacitor dielectric layer positioned between the storage node and the bottom
20 plate, on a sidewall of the deep trench, the storage node, the bottom plate, and
the capacitor dielectric forming a storage capacitance; and

a collar oxide layer disposed on the sidewall of the deep trench, the isolation
structure comprising:

a first isolation portion directly contacting and completely covering the top surface
of the storage node to separate and isolate the storage node from other
25 conductive elements positioned above the storage node, the first isolation
portion completely filling a top opening of the deep trench and having a first
thickness; and

a second isolation portion directly contacting the first isolation portion and
surrounding the deep trench without overlapping the deep trench, the second
30 isolation portion having a second thickness larger than the first thickness, *the
second isolation portion directly contacting and positioned beside and*

adjacent to both a top portion of the storage node and a top portion of the collar oxide layer.”

As shown in Fig.11, claim 1 limits that *the bottom of the second isolation portion 92 (including the oxide layer and the liner 84) directly contacts the buried strap 61, the top portion of the storage node of the trench capacitor 52, and the collar oxide layer 66. Claim 1 further limit that the second isolation portion 92 is positioned beside and adjacent to the buried strap 61 and the top portion of the collar oxide layer 66.*

Referring to Fig.2F of Lee's application, the insulator 270 in the shallow trench 260 has one first portion that covers the deep trench 210 and a second portion between the two deep trenches 210. The second portion of the insulator 270 is thicker than the first portion of the insulator 270. The collar oxide layer 227 is positioned on inner surface of the sidewall of the deep trench 210 and sounded by a doped region 240 positioned in the substrate 200 (col.3, lines 50-55). Accordingly, *the bottom of the second portion of the insulator 270 only contacts the doped polysilicon layer 230 and the doped region 240 but never directly contacts the collar oxide layer 227.* Therefore, the Lee's structure is different from that of this application. According to 35 U.S.C. 102(e), the applicants believe that this application should be patentable. Thus, reconsideration of claim 1 is politely requested.

Referring to claim 3, it describes that the bottom of the second isolation portion 92 is lower than the top surface of the collar oxide layer 66 it contacts (Fig.11). In contrast to this application, since the second portion of the insulator 270 of Lee's application never contacts the collar oxide layer 227, the bottom of the insulator 270 is not lower than a top surface of any collar oxide layer which is contacts by the insulator 270 contacts. Therefore, claim 3 of this application should be allowable. Reconsideration of claims 3 is respectfully requested.

Claims 2 and 7-8 are dependent upon claim 1, and therefore they should be

allowable if claim 1 is allowable. Reconsideration of claims 2 and 7-8 is hereby requested.

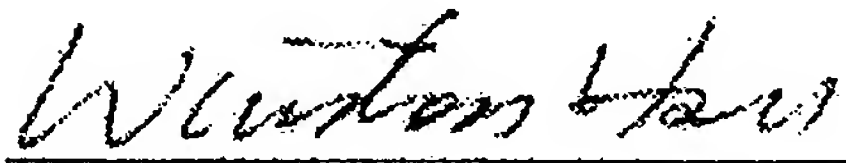
2. Rejections of claims 4-6 under 35 U.S.C. 103(a):

5 Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Alsmeier US patent No. 5,867,420 for reasons of record, as cited on 4-6 of the above-identified Office action.

10 Claims 4-6 are dependent upon claim 1, thus they should be allowable if claim 1 is allowable. Reconsideration of claims 4-6 is politely requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

15 Sincerely yours,



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25 Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 13 hours behind the Taiwan time, i.e. 9 AM in D.C. = 10 PM in Taiwan.)